

## **ABSTRACT OF THE DISCLOSURE**

The invention provides a series of  $G\alpha_q$  protein variants that functionally couple to sensory cell receptors such as taste GPCRs (TRs) and olfactory GPCRs (ORs) in an overly promiscuous manner. According to the invention, the functional coupling can be determined, for example, by measuring changes in intracellular IP3, or calcium. In a particular embodiment, the  $G\alpha_q$  protein variants can be expressed in mammalian cell lines or *Xenopus* oocytes, and then evaluated using calcium fluorescence imaging and electrophysiological recording.